

Work Order ID 138488

Wednesday, October 28, 2015 12:57:30 PM

138488

Page 1

Item ID: D206-667-147TRN

Accept

N900040100Setup Start ***NS1***

Revision ID:

Stop ***NS2***

Item Name: Crosstube Assembly, Mid Fwd

Start Date: 10/28/2015 Start Qty: 1.00

1

Cust Item ID:

Required Date: 10/28/2015 Req'd Qty: 1.00

1

Customer:

Reference:

Approvals: Process Plan: ML3 Date: OCT 28 2015

Tooling:

Date:

Run Start ***NR1***

QC: _____ Date: _____ SPC (Y/N): _____

Date:

Stop ***NR2***

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
--------------------------------	--------------------------	----------------------	---------	--------	--------------	---------------	---------------	------------------	----------------

Draw Nbr	Revision Nbr
D206-667-147	A

100

0.00

100

MORI SEIKI CNC LATHE LARGE

Mori Seiki

Memo

0.02

Mori Seiki CNC Lathe Large

1-Fill tube with sand & install plugs DTxxxx on both ends as per Folio FB029

2-Turn first side as per Folio FB029

3-File down transition lines smooth.

FOLIO REV: ADWG REV: A

(φ

mmml
16/02/16

110

QC1- Inspection performed by CMM

0.00

110

QC

Memo

0.00

Quality Control

QC2
8/6/01/19

(φ

mmml
16/02/17

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138488

Item ID: D206-667-147TRN

Accept

N900040100

Setup Start *NS

Revision ID:

Stop *NS

Item Name: Crosstube Assembly, Mid Fwd

Start Date: 10/28/2015 Start Qty: 1.00

1

Cust Item ID:

Required Date: 10/28/2015 Req'd Qty: 1.00

1

Customer:

Reference:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____
QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Run Start *NR

Stop *NR

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	I S
120	MORI SEIKI CNC LATHE LARGE	0.00							
120									
Mori Seiki	Memo	0.00							
Mori Seiki CNC Lathe Large	1-Turn second side as per Folio FB029 2-File down transition lines smooth. 3-Remove sand and plugs FOLIO REV: <u>AA</u> DWG REV: <u>A</u>								
130	QC1- Inspection performed by CMM	0.00							
130									
QC	Memo	0.00							
Quality Control									
140	QC8- Inspect parts - second check	0.00							
140									
QC	Memo	0.00							
Quality Control									

mmml
16/02/17mmml
16/02/17DAS
47
9-89

16-02-17

Work Order ID 138488

Wednesday, October 28, 2015 12:57:30 PM

138488

Page 3

Item ID: D206-667-147TRN

Accept

N900040100Setup Start ***NS1***

Revision ID:

Item Name: Crosstube Assembly, Mid Fwd

Stop ***NS2***Start Date: 10/28/2015 Start Qty: 1.00 ***1***

Cust Item ID:

Required Date: 10/28/2015 Req'd Qty: 1.00 ***1***

Customer:

Reference:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____

Run Start ***NR1***

QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Stop ***NR2***

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
145		0.00							
145						BL		16/02/23	
Crosstubes	Memo	0.01							
Crosstubes	GRIND ONLY TRANSITION LINES SMOOTH LONGITUDE WAY.								
150		0.00							
150						BL		16/02/23	
HandFXtube	Memo	0.01							
Hand Finishing Crosstubes	1- PRESSURE WASH X-TUBE INSIDE AND OUT								
	2- ALODINE AND ACID ETCH X-TUBE INSIDE AND OUT. USE RED SCOTCH BRITE								
160	QC7-Inspect Chemical Conversion Coat	0.00							
160						1			
QC	Memo	0.00							
Quality Control									

DAS
38

FEB 25 2016

Work Order ID 138488

Wednesday, October 28, 2015 12:57:30 PM

138488

Page 4

Item ID: D206-667-147TRN

Accept

N900040100

Setup Start

NS1

Revision ID:

Item Name: Crosstube Assembly, Mid Fwd

Stop

NS2

Start Date: 10/28/2015 Start Qty: 1.00

1

Cust Item ID:

Required Date: 10/28/2015 Req'd Qty: 1.00

1

Customer:

Reference:

Approvals:

Process Plan: _____

Date: _____

Tooling: _____

Date: _____

Run Start

NR1

QC: _____

Date: _____

SPC (Y/N): _____

Date: _____

Stop

NR2Sequence ID/
Work Center IDOperation
DescriptionSet Up/
Run Hours

Tool ID

Tool #

Plan
CodeAccept
QtyReject
QtyReject
NumberInsp.
Stamp

170

170

Packaging

Packaging

0.00

Memo

0.00

Packaging

LOCATION : LG014

BCL

16/02/23

180

180

QC

QC21- Final Inspection - Work Order Release

0.00

Memo

0.00

Quality Control

MCS

FEB 24 2016

FEB 9 2016

MCS

FEB 24 2016

Picklist Print

Wednesday, October 28, 2015 12:57:34 PM

Page 1

Work Order ID: 138488

138488

Parent Item: D206-667-147TRN

D206-667-147TRN

Parent Item Name: Crosstube Assembly, Mid Fwd

Start Date: 10/28/2015

Required Date: 10/28/2015

Start Qty: 1.00

Required Qty: 1.00

Comments: IPP rev:A 11.01.06 new issue DD verf:EC

Component Item ID/ Item Name	Replacement Item ID	Mfg/ Purch	Bin Item	Primary Location	Last Location	Route Seq ID	Unit of Measure	Qty on Hand	Qty per Kit	Total Qty	Qty Issued	Date Issued	Status
D6002-115		Manufactured	No			100	Each	78.0000	1	1			

D6002-115

Crosstube Material

<u>Location</u>	<u>Loc Qty</u>	<u>Loc Code</u>
HALL	60	
107867	60	
LG003	18	
69794	15	
75629	3	

_____ 1 mmmL 16/02/16

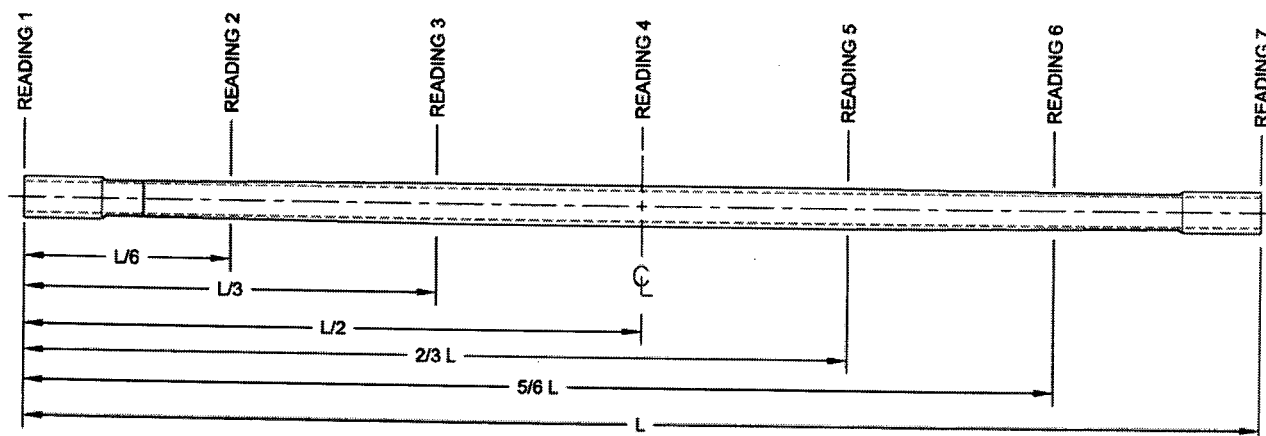
DART AEROSPACE LTD		Work Order:	138488
Description: Crosstube Assembly, Mid Fwd		Part Number:	D206-667-147
Inspection Dwg: D206-667-147 Rev: A		Page 1 of 2	

FIRST ARTICLE INSPECTION CHECKLIST

Inspection Sheet Drawing Dimension		Tolerance	Actual Dimension	Accept	Reject	Method of Inspection	Comments
SIDE A	2.240	+0.005/-0.000	2.242	/		vern	CNC - 08
	1.984	+0.005/-0.000	1.986	/			
	2.019	+0.005/-0.000	2.021	/			
	2.058	+0.005/-0.000	2.062	/			
	2.097	+0.005/-0.000	2.102	/			
	2.136	+0.005/-0.000	2.138	/			
	2.176	+0.005/-0.000	2.178	/			
	0.125	+/-0.010	.125	/		vern	CNC - 08
	R0.063	+/-0.010	.063	/		RG	
	R2.00	+/-0.010	2.00	/		"	
	R0.063	+/-0.010	.063	/		"	
	4.438	+/-0.030	4.440	/		vern	CNC - 08
SIDE B	2.240	+0.005/-0.000	2.240	/		vern	CNC - 08
	1.984	+0.005/-0.000	1.988	/			
	2.019	+0.005/-0.000	2.021	/			
	2.058	+0.005/-0.000	2.062	/			
	2.097	+0.005/-0.000	2.101	/			
	2.136	+0.005/-0.000	2.137	/			
	2.176	+0.005/-0.000	2.178	/			
	0.125	+/-0.010	.125	/		vern	CNC - 08
	R0.063	+/-0.010	.063	/		RG	
	R2.00	+/-0.010	2.00	/		"	
	R0.063	+/-0.010	.063	/		"	
	4.438	+/-0.030	4.440	/		vern	CNC - 08
	99.84	+/-0.020	99.84	/		tape	

DART AEROSPACE LTD	Work Order:	138488
Description: Crosstube Assembly, Mid Fwd	Part Number:	D206-667-147
Inspection Dwg: D206-667-147 Rev: A		Page 2 of 2

WALL THICKNESS MEASUREMENT



Location	WALL THICKNESS MEASUREMENT (IN)				Deviation Δw (max-min)	TOLERANCE
	w1	w2	w3	w4		
READING 1 L= 0"	.259	.258	.246	.246	.013	0.035"
READING 2 L= 17	.183	.172	.164	.171	.019	
READING 3 L= 33	.253	.248	.242	.241	.012	
READING 4 L= 50	.262	.257	.251	.251	.011	
READING 5 L= 67	.246	.239	.242	.246	.007	
READING 6 L= 83	.175	.164	.169	.182	.018	
READING 7 L= 99	.251	.250	.251	.253	.003	

Calibration Result

Actual Block Thickness: .700 .750

Sitescan 250 Measured Thickness: .700 .750

DAS
47

9-89

Measured by:	gmmL
Date:	16/02/17

Audited by:	9-89
Date:	16-02-17

Preliminary Approval:	
Date:	

Rev	Date	Change	Revised by	Approved
B	11.06.21	New Issue	KJ	
C	12.06.04	Wall thickness form added	KJ	

Item	Qty -147	Part Number	Description
1	X	D206-667-147	CROSSTUBE ASSEMBLY (206L MID FWD)
2	1	D6002-115	CROSSTUBE
3	2	D2873-043	NUT PLATE
4	2	D2873-045	NUT PLATE
5	2	D2891-1	SUPPORT
6	4	D3595-063-395	RUBBER CUSHION
7	4	MS21920-20	CLAMP (OR MS21920-21)
8	14	MS20601AD4W8	RIVET (OR NAS9302B-4-8)
9	A/R	MAGNOBOND 6398	ROCKWELL SPECIFICATION RBO-120-023 ADHESIVE (TEXTRON/BELL SPEC. 299- 947-100, TYPE II, CLASS 2 ADHESIVE)

GENERAL NOTES:

- 1) MATERIAL: MANUFACTURED FROM D6002-115
FINISHED LENGTH = 99.84±0.020
- 2) FINISH: CHEMICAL CONVERSION COAT PER DART QSI 005 4.1
PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2
PAINT OUTSIDE PER DART QSI 005 4.2
- 3) TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED.
- 4) UNITS: INCHES UNLESS OTHERWISE NOTED.
- 5) BREAK SHARP EDGES: 0.005 TO 0.010 MAX.
- 6) IDENTIFICATION: SCRIBE DART PART NUMBER "D206-667-147" AND BATCH NUMBER ON
INSIDE OF CUFF PER DART QSI 044 6.4 (VIBRATING STYLUS).
- 7) WEIGHT: 15.0 lbs (-507 ± 12.84)
- 8) PART IS SYMMETRIC ABOUT CENTERLINE.
- 9) RUN CUTTER OFF PART WHERE INDICATED. BLEND OUT EDGE LONGITUDINALLY,
TRANSITION SHOULD BE SMOOTH.
- 10) BEND PROGRESSIVELY WITH A MINIMUM OF 10 PASSES. MAXIMUM TUBE FLATTENING DUE
TO BENDING IS 6% BASED ON O.D.
- 11) LIQUID PENETRANT INSPECT OUTSIDE SURFACE OF CROSSTUBE PER QSI 038.
- 12) INSTALL D2891-1 SUPPORT USING 0.03" TO 0.06" THICK LAYER OF MAGNOBOND 6398 PER QSI
015. LET CURE FOR 12 HOURS AFTER INSTALLATION AND PRIOR TO PACKAGING.
- 13) INSTALL MS21920-20 CLAMPS (OR -21) WITH D3595-063-395 RUBBER CUSHIONS TO SECURE
THE D2891-1 SUPPORT ON TOP SIDE OF THE CROSSTUBE. ENSURE CLAMP MECHANISMS
ARE LOCATED ON CROSSTUBE SUPPORTS.
- 14) EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE SURFACE OF THE TUBE. THE
OUTSIDE SURFACE MUST BE SMOOTH AND FREE FROM SURFACE DEFECTS SUCH AS
SCRATCHES, NICKS, OR DENTS. DEFECTS UP TO 0.005" MAY BE BLENDED OUT
LONGITUDINALLY. CIRCUMFERENTIAL GRIND MARKS ARE UNACCEPTABLE.
- 15) TORQUE CLAMPS 80 TO 100 IN-LB. ENSURE AT LEAST 1.5 THREADS ARE SHOWING IN
SAFETY AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING.

SHOP COPY
RETURN TO
ENGINEERING
UNCONTROLLED COPY
SUBJECT TO AMENDMENT
WITHOUT NOTICE
WORK ORDER

NO. 138488 MJS
15-10-28
DEO ATTACHED

EW #11-665
11.07.28

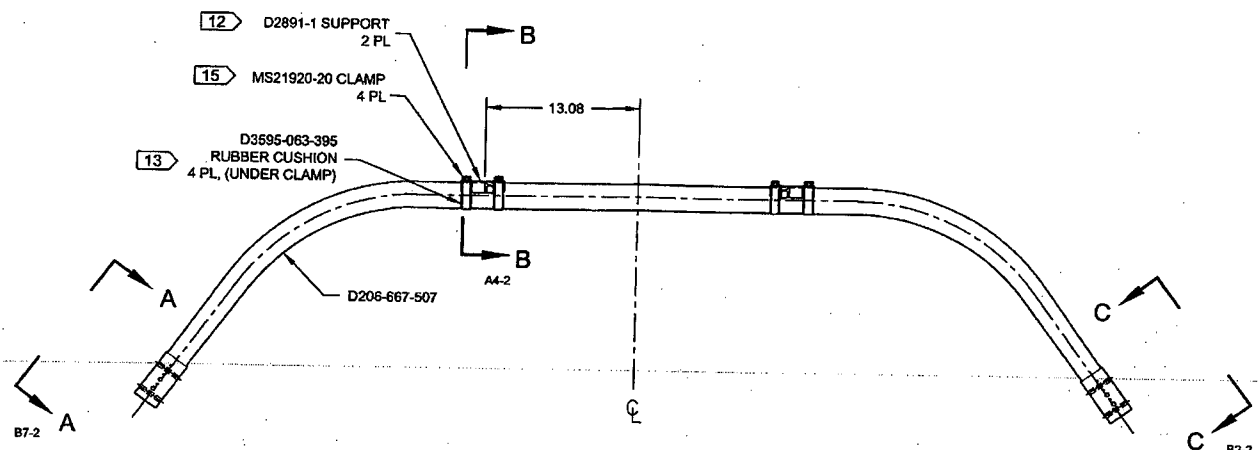
UNDER REVIEW

RELEASED
2011-05-23
JW

A	NEW ISSUE	CP	10.11.23
REV.	DESCRIPTION	BY	DATE
DESIGN			
DRAWN			
CHECKED			
MFG. APPR.			
APPROVED			
DE APPR.			
DATE	10.12.23		

DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA	
DRAWING NO. D206-667-147	REV. A SHEET 1 OF 4
TITLE CROSSTUBE ASSY (206L MID FWD)	SCALE NTS
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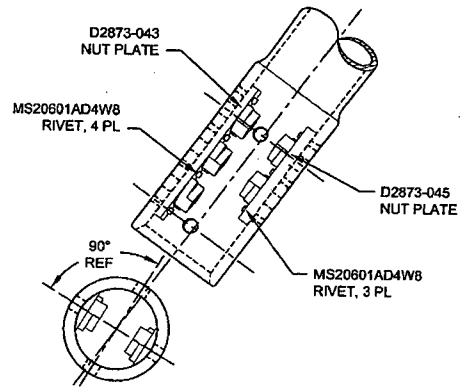


D206-667-147
ASSEMBLY DETAIL
(VIEW LOOKING FWD)

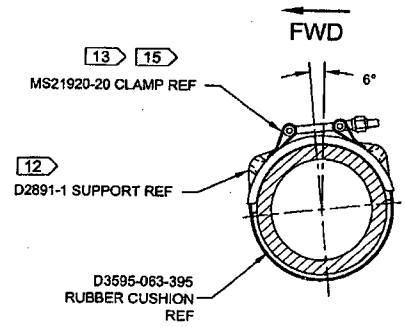
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UNDER REVIEW
11/06/03

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2011-05-24

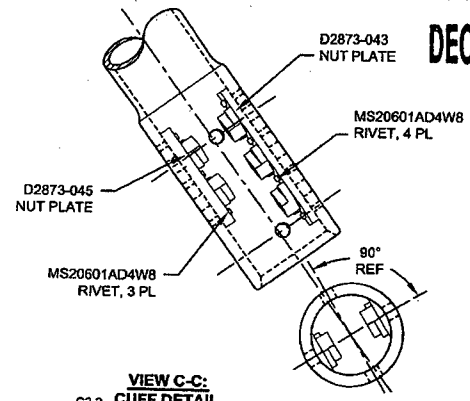
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VIEW A-A:
CUFF DETAIL
SCALE 4X



SECTION B-B
SCALE 5X



VIEW C-C:
CUFF DETAIL
SCALE 4X

DESIGN	97	DART AEROSPACE LTD	
DRAWN	97	HAWKESBURY, ONTARIO, CANADA	
CHECKED	97	DRAWING NO.	REV. A
MFG. APPR.	97	D206-667-147	SHEET 2 OF 4
APPROVED	97	TITLE	SCALE
DE APPR.	97	CROSSTUBE ASSY (206L MID FWD)	NTS
DATE	10.12.23	COPYRIGHT © 2010 BY DART AEROSPACE LTD THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD.	

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8

7

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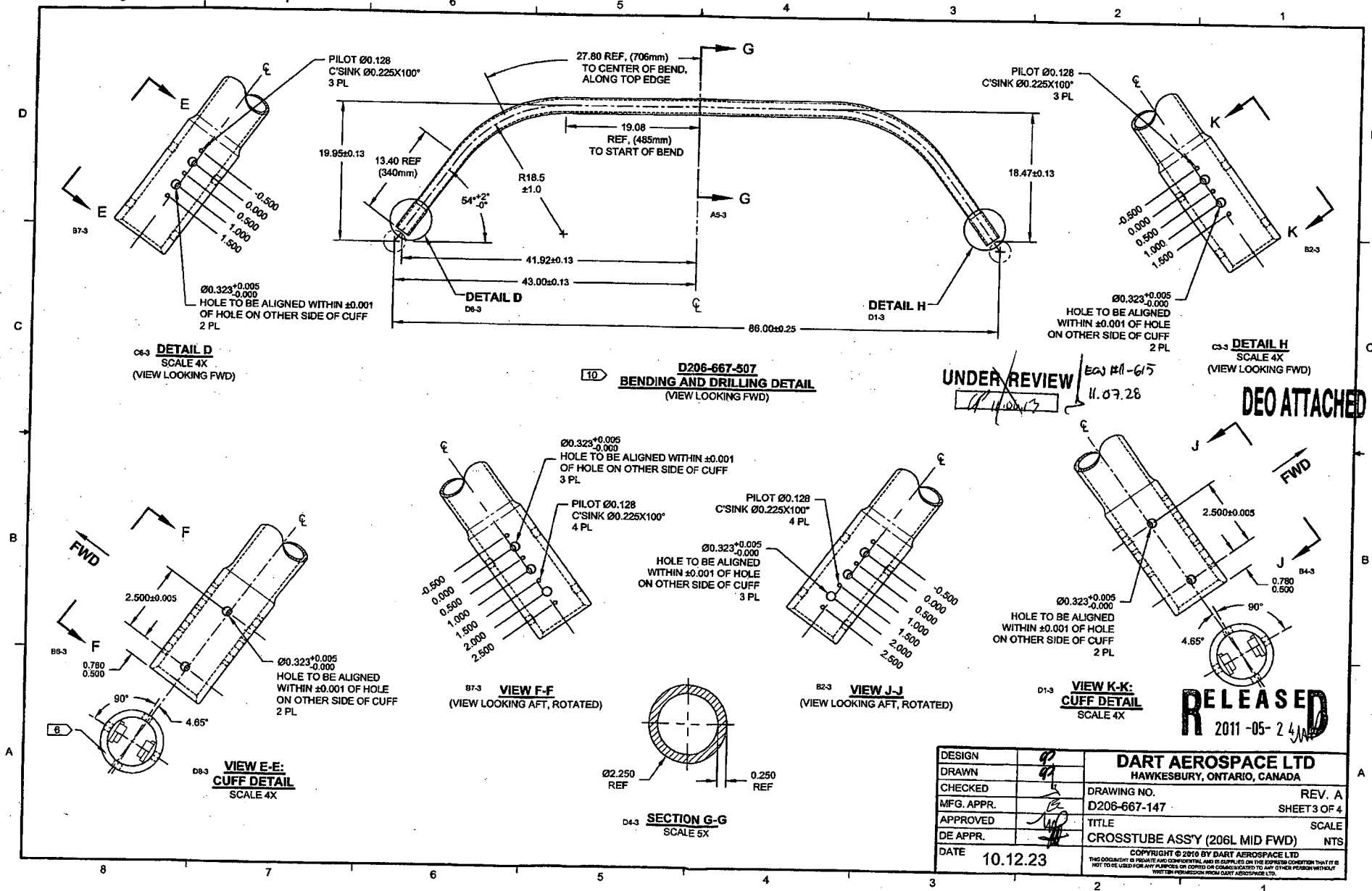
5

4

3

2

1



8 7 6 5 4 3 2 1

D

C

B

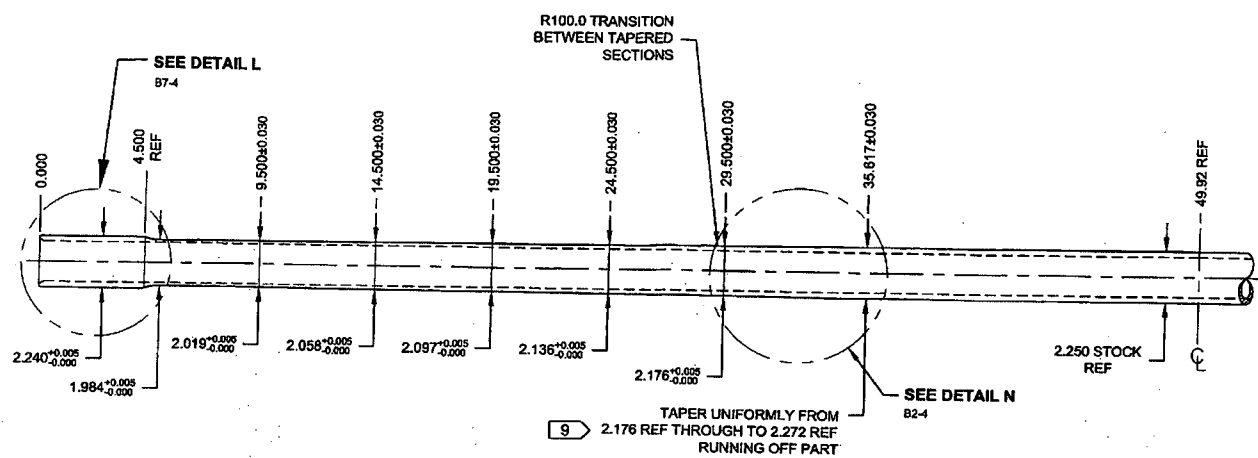
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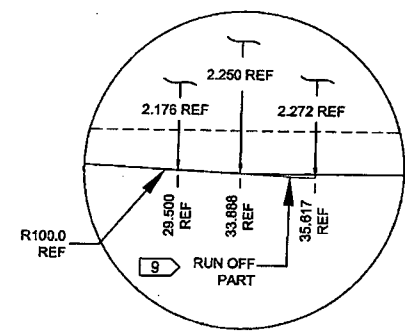
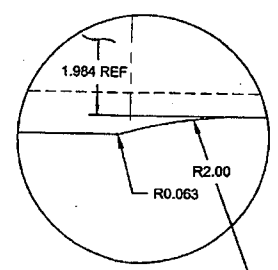
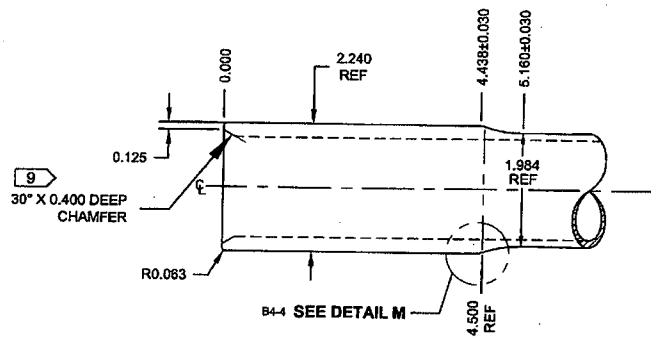
B

A



UNDER REVIEW
11.06.13
805411-615
11.07.20

TURNING DETAIL



DEO ATTACHED

RELEASED
2011-05-23

DESIGN		DART AEROSPACE LTD
DRAWN		HAWKESBURY, ONTARIO, CANADA
CHECKED		DRAWING NO. REV. A
MFG. APPR.		D206-667-147 SHEET 4 OF 4
APPROVED		TITLE SCALE
DE APPR.		CROSSTUBE ASS'Y (206L MID FWD) NTS
DATE	10.12.23	

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8 7 6 5 4 3 2 1

DRAWING NO. D206-667-147	TITLE CROSSTUBE ASS'Y (206L MID FWD)	REV. A	DART AEROSPACE LTD ENGINEERING ORDER		D.E.O. NO. D206-667-147-A-1	SHEET NO. SHEET 1 OF 1	SCALE NTS
DRAWN <i>qp</i>	CHECKED <i>AJS</i>	MFG. APPR. <i>JB</i>	APPROVED <i>MD</i>	DE APPR. <i>[Signature]</i>			
DATE 11.07.15	DATE 11.07.20	DATE 11.07.21	DATE 11/07/21	DATE 11.07.21			

PURPOSE:

REPLACE MAGNOBOND WITH PROSEAL.

CHANGE:

IS:

Item	Qty -147	Part Number	Description
9	A/R	PROSEAL 890 B-2	SEALANT, AMS-S-8802 CLASS B-2

WAS:

9	A/R	MAGNOBOND 6398	ROCKWELL SPECIFICATION RBO-120-023 ADHESIVE (TEXTRON/BELL SPEC. 299-947-100, TYPE II, CLASS 2 ADHESIVE)
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NOTE 12 & 15, SHEET 1 IS AMENDED AS FOLLOWS:

IS:

- 12) TO INSTALL D2891-1 SUPPORT: ABRABE MATING SURFACE OF SUPPORT AND CROSSTUBE WITH 180-GRIT SANDPAPER AND REMOVE RESIDUE WITH MEK (OR EQUIVALENT). APPLY A 0.04" TO 0.07" THICK LAYER OF PROSEAL 890 CLASS B-2 (OR AMS-S-8802 CLASS B-2) SEALANT TO MATING SURFACE OF SUPPORT.
- 15) TORQUE CLAMPS 80 TO 100 IN-LB. ENSURE AT LEAST 1.5 THREADS SHOWING IN SAFETY AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING. **PRIOR TO PACKAGING, RE-CHECK TORQUE ON CLAMPS AFTER PROSEAL 890 SEALANT HAS CURED FOR 72 HOURS.**

WAS:

- 12) INSTALL D2891-1 SUPPORT USING 0.03" TO 0.06" THICK LAYER OF MAGNOBOND 6398 PER QSI 015. LET CURE FOR 12 HOURS AFTER INSTALLATION AND PRIOR TO PACKAGING.
- 15) TORQUE CLAMPS 80 TO 100 IN-LB. ENSURE AT LEAST 1.5 THREADS SHOWING IN SAFETY AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING.

RELEASED
2011-07-28
[Signature]

DRAWING NO. D206-667-147	TITLE CROSSTUBE ASS'Y (206L MID FWD)	REV. A	DART AEROSPACE LTD ENGINEERING ORDER	D.E.O. NO. D206-667-147-A-2	SHEET NO. SHEET 1 OF 1	SCALE NTS
DRAWN AJS	CHECKED	MFG. APPR.	APPROVED	DE APPR.		
DATE 12.08.02	DATE 12.08.02	DATE 12.08.02	DATE 12.08.02	DATE 12.08.02	DATE 12.08.02	

PURPOSE:

ADD ELECTRICAL GROUNDING STRAP

CHANGE:

PARTS LIST:

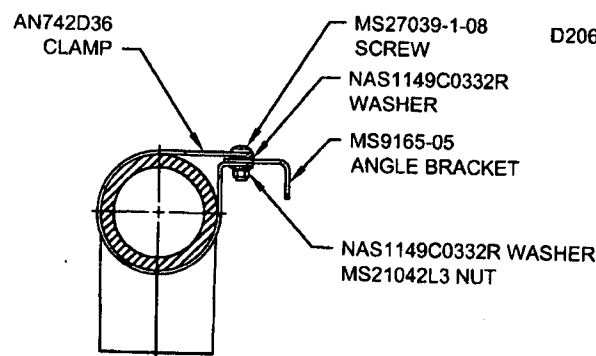
ITEM	QTY -147	PART NUMBER	DESCRIPTION
1	X	D206-667-147	CROSSTUBE ASSEMBLY (206L MID FWD)
10	2	AN742D36	CLAMP
11	2	MS9165-05	ANGLE BRACKET
12	2	MS21042L3	NUT (OR MS21042-3)
13	2	MS27039-1-08	SCREW
14	4	NAS1149C0332R	WASHER (OR AN960C10L)

GENERAL NOTES:

- 16) MASK AREA UNDER CLAMP PRIOR TO PAINTING
- 17) SEAL EDGES WHERE AN742D36 CLAMP MEETS WITH THE CROSSTUBE USING SIKAFLEX-241/-291 OR MIL-S-8802 CLASS B2 OR PROSEAL 890 SEALANT
- 18) PERFORM RESISTANCE CHECK TO ENSURE MAX RESISTANCE IS 10 MILLIOHMS

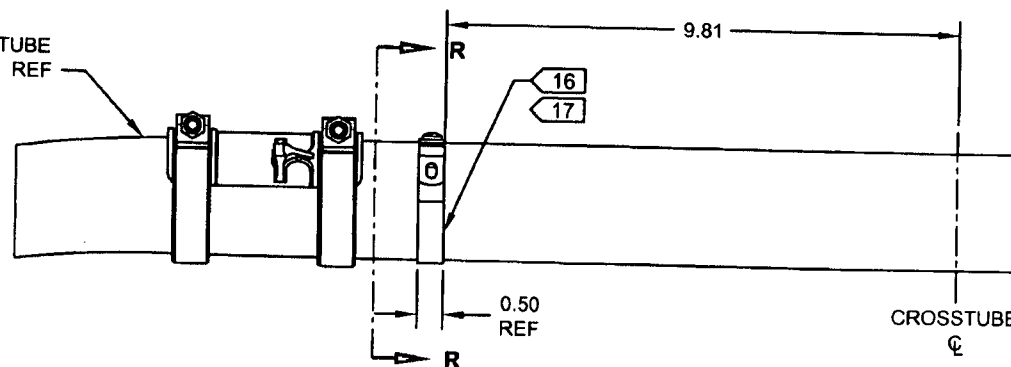
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12.08.17
ECN 12-431



SECTION R-R

D206-667-507 CROSSTUBE REF



DETAIL P
BONDING STRAP INSTALLATION 2 PL